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ABSTRACT

This document reports the rationale, design, and execution of a longitudinal investigation of the intellectual achievement effects of a cognitively oriented preschool for disadvantaged Mexican-American children in San Jose, California. Seven groups of children ages 3-5 were studied. Two groups were exposed to two ten-week successive summer sessions of training prior to entry into kindergarten. Their program emphasized cognitively structured small group experiences with 4-5 children in each group. Group leaders were local Mexican-American high school students working under the supervision of experienced primary teachers. The other five groups were comparison groups; two were from outside the geographical area and three were from the school attendance area of the training groups. Seven hypotheses were tested through gathering and processing psychometric data from school-related achievement ability tests. Results were compared longitudinally across groups to determine the early advantage of specific cognitive training. All groups were tested at regular intervals and evaluations of in-school performance were made through kindergarten, first and second grades. In general, there were short-term gains but later, few differences existed between the training and comparison groups. An appendix provides samples of the training lessons plus information about project matters. (WY)

FINAL REPORT

EFFECTS OF PRESCHOOL STIMULATION UPON SUBSEQUENT SCHOOL PERFORMANCE AMONG THE CULTURALLY DISADVANTAGED

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September 30, 1970

The research reported herein was performed pursuant to a contract with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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Acknowledgments are supposed to be to persons who have made crucial contributions to a venture, and at the same time, they are supposed to be brief. For a research venture which lasted from October 1965 to September 1970 and involved many persons, the combined requirements of crucial contribution and brevity are nearly impossible. The Project Director herein chooses crucial contribution over brevity as the criterion for acknowledgments.

There are four groups, all listed in Appendix D, to whom acknowledgments must be made: Small Group Leaders, Training Unit Teachers, Research Assistants, and Consultants. Collectively, members of these groups stand as long-term evidence that people who differ in ethnic group background and in age can indeed work effectively together!

"Small Group Leaders, you had the most direct and sustained effective contact with our youngsters and their parents. Anyone who asserts that poverty, minority group young adults will not or cannot assume responsibility and creatively carry out assignments is simply wrong. Your behavior attests to that!"

"Training Unit Teachers, in the beginning and throughout, it was your capable leadership and resourcefulness, which markedly influenced the Small Group Leaders' daily activities and the preschool program generally. Experienced kindergarten teachers can and do adapt readily and effectively to somewhat new or different arrangements and personnel. Your sustained flexibility coupled with your abilities to keep a program focus foremost attests to that. We all learned from you; you are truly Master Teachers!"

"Research Assistants, you might never be called upon again to perform capably the variety of tasks in the name of research which you performed, and performed well. If other new Ph.D. psychologists are like you in wanting to bring the power of your science to bear upon solutions to pressing human problems, psychology as a meaningful discipline will not only survive but thrive. We need all like you we can find; would that the number was large!"

"Consultants, collectively you kept us within the bounds of science, the laws, and common sense. In this you served with patience and a sense of humor; you served well!"

Though it must seem mundane, the Project Director says thanks to you all. In the spirit of the project, and learned from and through you --- "Vaya con Dios and hang loose!

W.T.P.

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CHAPTER I

INTRODUCTION

Since the middle of the 1960's, there has been widespread implementation of pre-school programs for the disadvantaged. Great hopes have rested on the premise that if children are prepared for school, they will succeed in academic affairs, remain in the school setting for longer periods of time, and eventually become productive, participating citizens. Most efforts to reverse the spiraling trend of greater poverty and less education for the disenfranchised segments of our population have not been successful. No wonder that so many have grasped at the notion that to reverse the syndrome, one must begin at the beginning. Thus, pre-school education has been considered almost a panacea for the ills of the disadvantaged.

The literature concerned with ameliorative programs for the disadvantaged has recently burgeoned. Yet, there is little that is highly organized so that conclusions as to the effectiveness of such projects may be evaluated. Many groups of the disadvantaged have been studied (e.g., American Indian, Negro, Appalachian Whites, Mexican-American). Treatment foci and structures of the various programs are different. Evaluation of the enrichment programs are not systematic, and different evaluation instruments and techniques have been employed. Conclusions as to the effectiveness of these various programs are in conflict.

Many of the programs which have been developed to provide pre-school education for the disadvantaged young, have had Negro children as targets. In recent years, the plight of the American Negro has become widely known and strong political support for projects aimed at the Negro has arisen. Few attempts have been made to reach another segment of the disinherited in America, namely the Mexican-American. Yet, there is ample documentation that the Mexican-American youth is in dire need of academic attention and help (3, 11, 12, 33, 52). The effects of the progressive academic retardation of culturally disadvantaged Mexican-American children has led to: (a) a greater proportion of Mexican-American children over what would be expected in school remedial programs of all kinds at all levels; (b) a greater proportion than to be expected in special education classes for the mentally retarded; (c) a greater proportional drop-out rate in junior and senior high schools for Mexican- compared with Anglo-American students; (d) a greater proportional rate of school failure and retention in grade for Mexican- over Anglo-American students; and (e) a disproportionate number of Mexican- over Anglo-American people in unskilled occupational groups or the unemployed. Samora's (39) analysis of the 1960 census data revealed that the median number of school grades completed by Mexican-Americans in California was 8.6 in contrast to the median number of 12.1 for Anglo-Americans. Other data having to do with percentages of Mexican-Americans versus Anglo-Americans and education are as

dismal. For example, in a local study reported by Baker (3) among a group of high school students studied, 43 percent of the total number of drop-outs were from Mexican-American bilingual homes while only 12.3 percent of the graduating class were Mexican-American. Such data strongly support the need for ameliorative efforts in the low income Mexican-American community.

General Statement of the Problem Studied

The present investigation was concerned with providing and evaluating a highly cognitively structured pre-school experience for very young disadvantaged Mexican-American children. Rather than a usual summer of training before school entrance, the project provided two full summers of treatment. Rather than evaluating the effects of the project in terms of performance the first year of pre-school only, a longitudinal design was used. Evaluations of in-school performance were made through kindergarten, first, and second grade. Samples of intellective functioning and in-school achievement were collected and analyzed.

CHAPTER II

REVIEW OF THE LITERATURE

Preschool education for the disadvantaged was begun on a massive scale in 1965 when the federal program Operation Head Start was implemented. Other federally sponsored programs of preschool enrichment for the disadvantaged were begun even before the onset of Operation Head Start programs (2,20,46). Early programs as well as subsequent ones have tended to have two sets of goals. The immediate goals have been to establish good attitudes towards school and also to help the involved children enter school with a more highly developed cognitive system for learning. Also involved in the immediate goal has been higher levels of academic performance, usually defined as performance during the first year of school.

The ultimate goals have been to off-set many of the cultural and social ills associated with school failure and drop-out, and the resulting impact of low educational attainment levels upon subsequent employment and income. Implicit in the ultimate goal has been the notion that success in school throughout the learning process is necessary for the ultimate end to be reached. Presently, it has been well-documented that low socio-economic status (SES) children do not reach the performance levels of middle SES children. Deutsch (14) has said that by the time low SES children reach first-grade they are already pre-programmed

for failure." Initial school failure has been interpreted to lead to a greater probability of later school failure and early termination of education. Thus, many members of the growing low SES population now reach maturity without the developed ability or skills required to leave the ghettoes.

The position of the sponsors and workers in preschool training for the disadvantaged has been one of "intervene before the effects of deprivation are irreversible." This position may be traced specifically to the work of Hunt (25) and of Piaget (35). Both Hunt and Piaget have suggested that very early experiences, especially in terms of variety of environmental stimuli and verbal interaction, are extremely important in later cognitive growth. Piaget's theory of intellectual development states that before a child can move to a new learning plateau, he must first have mastered concepts on the lower plateau. Jensen's (29) theory on Levels I and II of intellectual development is similar to Piaget's in this respect. According to Piaget, concepts are most easily mastered by having a variety of exemplars of the concept available. In effect, the environment stimulates the child to explore, assimilate, and master.

Writing from essentially the same position, Hunt (24,25) suggests that intellectual development is dependent upon a rich and varied sensory input. Children who lack such an environment

or who are unable to interact effectively with the environment will be inadequate in intellectual functioning. It follows that children who are not restricted continue to seek sensory input. Mildly incongruous input will provide motivation to seek further stimulation, thus motivation becomes an integral part of cognitive development. Hunt contends that stimuli restriction or enrichment in the first few years of life may be the most important. He also argues that the duration of environmental sensory deprivation will determine the severity of deficits incurred.

Children from low SES families frequently do not have the varied and rich environments thought important in intellectual growth. Thus, by the time the culturally disadvantaged child reaches school there may be little correspondence between what the child has assimilated from his environment and the sensory input provided by the school. Such a situation may lead to disruption in cognition and negative motivation. This would suggest that ameliorative programs should be designed to decrease the incongruity between the child's early sensory experience and that which he would encounter in the school environment. Assimilation of sensory input congruent with later school experience should provide a foundation for appropriate development. Such sensory stimulation, then, should occur prior to school entrance and as early in the child's life as possible.

These two developmental positions have been the leading force in planning enrichment programs for preschool disadvantaged children. Numbers of different kinds of preschool programs have been implemented which follow, to a greater or lesser extent, the suggestions and conclusions of Hunt and Piaget.

The literature on preschool intervention among the disadvantaged is familiar to almost all now. Thus, an extensive review of the literature is unnecessary today. There is, however, some necessity for making some gross distinctions about the kinds of preschool programs which have been developed.

Weikart (50) has suggested that there are two main classifications which may be used to distinguish preschool programs. His classification system is based upon the teaching method employed rather than over-all project services rendered. The first type of preschool program may be called "traditional." In this class of programs the teacher watches and waits for the child's preferences to emerge and that determines the timing of different activities. This "traditional" program is one most familiar to middle SES parents who send their children to preschool or nursery school. The primary goals are for social, emotional, and motor development to be accomplished through rather unstructured activities.

The second class of preschool programs, according to Weikart,

may be called a "highly cognitively structured" program. This type of program rests upon carefully planned presentations of activities that are based on a specific developmental theory. Traditional nursery or preschool materials are used but the primary goals are always stated in intellectual and language development terms. Many of the preschool programs for young disadvantaged children have used the "structured" model (7,15, 20,31,36,43) while many other efforts have been made using the "traditional" model (1,10,22,40). Weikart has suggested that the "structured" programs typically yield more favorable outcomes than do the "traditional" programs.

Implicit in the "structured" preschool model is use of a learning theory in preparation of program materials and teaching methods as well as a developmental theory. Modification of many behaviors including intellectual behaviors may be enhanced by the use of reinforcements during the training process. Two different learning theories make use of systematic reinforcements. The first is the well-known instrumental conditioning paradigm (42). The second is called a social learning theory (6). Both models called for the S to be rewarded, either concretely or verbally, when the behavior desired is either approximated or emitted.

Skinner (42) has suggested that reinforced behavior is more

likely to recur than is non-reinforced behavior. Further he suggests that behavior that has been systematically rewarded may become intrinsically rewarding in and of itself. These principles are used unsystematically by most parents in child rearing. These principles are used more or less systematically in the learning process in the schools. Bandura and Walters (6) have refined the early principles of Skinner so that the concept of reinforcement and its resulting impact on behavior has been broadened. The use of systematic reinforcement has been shown to be effective in the modification of the syntactic style of children (4), the modification of children's moral judgments, (5) and in traditional learning tasks (44). The application of reinforcements during acquisition of appropriate learning skills should result in both shortening the time required for completion, and also mastery of the skill learned. Reinforcement principles were systematically used in the present study.

Only one specific program employing the "structured" preschool model will be reviewed in detail here. This program was chosen for careful analysis because of its similarities to the current study. The Early Training Project (20,30,31) was developed to provide preschool enrichment for culturally disadvantaged Negro children in Tennessee. Two experimental groups of children had two or three summers of a 10-week preschool plus

weekly meetings with a home visitor prior to entrance into first-grade. Two control groups were included; one in the same area and one in a town 60 miles away. The treatment centered around efforts to instill achievement motivation, to encourage persistence and ability to delay gratification, and to help Ss to identify with achieving role models. This project stressed acquisition and the development of language skills. This was done by having a high ratio of adults to children, and by encouraging oral language throughout the preschool classes. Highly individualized instructional techniques were used. Every attempt was made to plan the activities for each S according to the S's particular needs.

To the point of Ss' entry into school the project was considered very successful. Using conventional intelligence tests, the investigators reported that the experimental Ss showed positive and significant changes in IQ scores. The control Ss, on the other hand, showed progressive retardation, a frequently observed phenomenon among young culturally disadvantaged. During the first year of school, the experimental Ss did not maintain their accelerated growth but rather tended to remain at the level at which they were functioning at the beginning of school. The control Ss, however, made rapid gains in intellectual functioning during the first school year. During the second year of schooling there was a decline in intellective functioning, as measured by

intelligence tests, for both control and experimental Ss.

These kinds of outcomes have been reported by other investigators who have attempted evaluation of the long-term effects of preschool training of disadvantaged children. DiLorenzo and Salter (16) reported that at the end of preschool training, significant differences were observed between experimental and control Ss on various IQ measures. However, when the Metropolitan Readiness Test was administered to all Ss at the end of kindergarten, it was revealed that the kindergarten experience did not build on the differences associated with the preschool experience. In particular, it was found that the non-white experimental Ss lost any advantage whatever, while white experimental Ss maintained their pre-kindergarten advantage. The conclusions drawn by DiLorenzo and Salter were that programs of longitudinal effectiveness for non-whites have not been yet devised, or that disadvantaged non-whites more than whites require the continuation of special programming to counteract the adverse effects of their environment.

Similar findings were reported by Wilkerson (51) in a two-year evaluation of the Perry Preschool Project (50). After one year of training, experimental Ss earned significantly higher IQ scores than did the control Ss. This was not found at the end of the second year after preschool training.

Likewise, the early encouraging results of evaluation of Operation Head Start programs were reversed when time had intervened between training and evaluation. For example, Eisenberg and Conners (18) initially evaluated the effects of Head Start training at the beginning of kindergarten. Head Start Ss were found to have earned significantly higher scores on intelligence tests than comparable control Ss. A follow-up study of the same groups was performed by Waller and Conners (47) after nine months of kindergarten. The average gain over the school year by the control group exceeded that made by the Head Start group.

A recent unpublished study (9) was concerned with first-grade children who had had Head Start experience. After a year of kindergarten and first-grade, the Head Start children were behind their matched comparison group in scores from the Stanford Achievement Test. Many other examples of the "wash-out" phenomenon have been reviewed by Shriver (41).

It appears that the early promise associated with preschool education for the disadvantaged has not been realized. Initial positive effects have been shown to fade after just a year or two in the regular school system. Further longitudinal research is needed to determine what lasting effects, if any, are associated with specific preschool programs for specific sub-groups of the disadvantaged. This is one such investigation.

CHAPTER III

METHOD

Subjects

Seven different groups of Ss were involved during the five years of the investigation. In all cases the groups were composed of children identified as Mexican-American on the basis of surname. Five of the seven groups of Ss resided within the school attendance areas of the Mayfair and San Antonio Schools in the Alum Rock Union Elementary School District, San Jose, California.

Training Unit Subjects

Training Unit 1 (T1) Subjects

During the Spring of 1966, 51 Mexican-American children born between December 3, 1961 and December 2, 1962 were selected for participation in the project. All Ss resided within the school attendance areas of Mayfair and San Antonio Schools. This geographic location has been described elsewhere (12) as a badly blighted poverty pocket. These Ss were pre-tested with the Stanford-Binet, L-M (SBLM) and the Peabody Picture Vocabulary Test (PPVT) prior to entry into the project program.

All T1 Ss attended 10 (five-day) weeks of pre-school training during the summer of 1966. At the end of the summer session only 40 of the original T1 Ss remained in the community. All T1 Ss still residing within the school attendance area in June

of 1967 (N=29) returned for a second 10-week summer session. At the end of the second summer training session, 26 T1 Ss remained. These Ss entered kindergarten in the fall of 1967.

Training Unit 2 (T2) Subjects

During the Spring of 1967, 57 Mexican-American children born between December 3, 1962 and December 2, 1963 were selected for participation in the project. The T2 Ss resided in same geographic area as T1 Ss. All T2 Ss were tested with the SBLM and PPVT prior to beginning the project program.

The T2 Ss attended 10 (five-day) weeks of pre-school training during the summer of 1967. At the end of this first summer session, 53 T2 Ss remained in the community. All T2 Ss still residing within the school attendance areas in June of 1968 (N=38) returned for a second 10-week summer session of pre-school training. At the end of the second summer training session, 32 T2 Ss remained. These Ss entered kindergarten in the fall of 1968.

Comparison Group Subjects

The phenomenon of the extended family in the Mexican-American community and its resulting effect upon inter- and intra-family decisions and communication (12,27) made it necessary to provide for an extra-mural comparison group. Two "outside-the-area" comparison groups were formed to control for possible contaminating effects of communication between and within families residing within the experimental locale. These comparison Ss were selected

from available Mexican-American children of the appropriate ages in the Mexican-American community within Healdsburg, California.

Outside-Area Comparison Group, 1966 (CG'66)

Twenty Mexican-American children from Healdsburg, California were identified and tested in the Spring of 1966 with the SBLM and PPVT. None of these Ss was exposed to pre-school experiences during this summer. Like their comparable T1 Ss, the CG'66 Ss were all born between December 3, 1961 and December 2, 1962. At the end of the summer of 1966, there were 17 CG'66 Ss remaining in the community; they were retested with the dependent variable instruments.

Outside-Area Comparison Group, 1967 (CG'67)

Twenty-one Mexican-American children from Healdsburg, California were identified and tested in the Spring of 1967 with the SBLM and PPVT. Like their comparable T2 Ss, the CG'67 Ss were all born between December 3, 1962 and December 2, 1963. None of the CG'67 Ss was exposed to pre-school experiences during the 1967 summer. At the end of the summer of 1967, there were 16 CG'67 Ss remaining in the community; they were retested with the dependent variable measures.

There were many Mexican-American children residing in the same school attendance area as T1 and T2 Ss who would have been eligible for participation in the project program, but were not identified and selected for participation. Such eligible Ss

provided the comparison groups for both experimental samples. In addition, a "front-wave" comparison group was selected from the kindergarten population at the Mayfair School in 1965, prior to possibility of their participation in the project.

In-School Front-Wave Comparison Group, 1965 (C'65)

All Mexican-American children attending kindergarten classes at the Mayfair School in the fall of 1965 served as C'65 Ss. The C'65 group was comprised of 69 children. Dependent variable measures were administered to C'65 Ss during the early part of the 1965-66 academic year.

In-School Comparison Group, 1967 (C'67)

All 64 Mexican-American children enrolled in the kindergarten classes at Mayfair and San Antonio Schools in the fall of 1967, but who had not participated in the project pre-school program, served as comparison Ss for T1 Ss. All C'67 Ss were tested with the dependent variable measures at the same time as were the T1 Ss. Examiners had no knowledge of why they were testing Ss so they had no knowledge of which Ss were T1 Ss and which were C'67 Ss.

In-School Comparison Group, 1968 (C'68)

All 63 Mexican-American children enrolled in the kindergarten classes at Mayfair and San Antonio Schools in the fall of 1968, who had not participated in the project pre-school program, served as comparison Ss for T2 Ss. All C'68 Ss were tested with the

dependent variable measures at the same time as were the T2 Ss. Examiners had no knowledge of why they were testing Ss so they had no knowledge of which Ss were T2 Ss and which were C'68 Ss.

Experimental Personnel

Two different teaching staffs were utilized in the project. Professional school district kindergarten teachers planned broad objectives and activities during the summer, and they supervised the daily teaching of Mexican-American Small Group Leaders (SGL) who were all non-professionals with no formal teaching experience.

Training Unit Master Teachers

For both T1 and T2 groups, one experienced kindergarten teacher was assigned to each 25-30 children. Four different training unit teachers participated in the summer sessions. All teachers had been nominated by school district personnel as being one of the best primary teachers in the district. Two teachers were assigned to work with T1 Ss and SGL's during the summer of 1966. One of these teachers returned to work with the T1 Ss in the summer of 1967. Two teachers were assigned to work with T2 Ss both summer of 1967 and summer of 1968.

Small Group Leaders

Since all children to be treated were of Mexican-American origin, and few Ss were fluent in English at the beginning of the project, high school students of Mexican-American background were assigned many of the actual teaching duties. These "learning

teachers" or Small Group Leaders (SGLs) were identified from the Mexican-American students attending Overfelt High School, San Jose, California. All SGLs had been nominated by members of the high school counseling staff as achievement-oriented and interested young people. There were, in all, 19 such SGLs selected, nine of whom were male and 10 of whom were female.

Each SGL was assigned to teach five or six experimental Ss each summer. The SGL had the responsibility of planning, executing, and evaluating the daily lessons under the supervision of the Training Unit Master Teachers. See Appendix A for sample lessons and evaluations of Master Teachers and SGLs.

Training Program

The basic treatment for all training unit Ss took place over a 15-month period prior to Ss' entry into kindergarten. Each group of training Ss attended two 10-week summer sessions and nine one-day meetings (once a month over nine months) during the time intervening between the two summer treatment programs. Thus, each S spent as many as 109 days in the experimental program. Absenteeism among Ss was fairly high, and so few Ss attended more than 100 training days in the program.

The training sessions were highly structured and cognitively oriented. The primary focus of all activities was one of Ss mastering and using concepts and skills thought to be important in the formal education process. Development of three different

categories of cognitive skills served as the core around which specific activities were planned. The skill categories were: (a) perceptual and motor abilities; (b) concept formation and attainment; and (c) language fluency.

Perceptual and motor abilities tasks emphasized the Ss' gaining ability to discriminate figure and ground relationships and to develop spatial orientation. These two abilities are thought to be particularly important in the early stages of reading. In addition, perceptual and motor tasks designed to enhance the Ss' perception of numerosity, color discrimination, and development of hand-eye coordination were undertaken. See Appendix B for a listing of some specific activities used in the sessions with perceptual and motor skills development as a focus.

The category of concept formation and attainment was broadly defined. Initial procedures concentrated on development of Ss' knowledge of their immediate environment. School environmental structure was provided by the staff in an attempt to offset the inconsistent objects and people in the Ss' home environments. Family, self, and the everyday world provided many of the concepts to be mastered. The main stress was placed, however, upon color and number concepts and language development. Following Irwin's (28) lead, emphasis was placed on a wide content of reading materials. See Appendix B for samples of specific activities which stressed concept formation and attainment.

Language fluency was frequently the very heart of treatment lessons. It has been suggested that a relatively high ratio of adults to children fosters a climate which promotes increased language usage. Milner (34) demonstrated that wide participation in adult conversations is a crucial variable in good language development. The adult to child ratio in the present project was quite high and the staff worked intensively to elicit appropriate verbalizations from Ss in all activities. Constant effort was made throughout the program to make verbalization the instrumental act leading to reinforcement. For example, Ss were encouraged to verbally state their desires (what paint color to use, which book to look at, etc.) rather than using a simple pointing response. Strict reinforcement procedures were employed to help Ss improve in their verbalizations.

In all activities, both concrete and secondary reinforcements played large roles. It has been amply demonstrated that behavior may be modified through the judicious use of reinforcers. Appropriate reinforcers in the school setting are, of course, various forms of verbal praise. At the outset of the current project tangible rewards such as M & M candies, paper stickers, and animal stamps were used whenever Ss were successful (or approximated success) on tasks. These concrete rewards were always paired with verbal praise and physical contact. Gradually (by the end of the third week of the first summer session) the concrete rewards were dropped as Ss learned to accept verbal reinforcers for their achievements.

The pairing of consistent reinforcements with cognitively oriented task completion was designed to produce positive attitude toward school activities. Development of appropriate attitudes is related to the concept that the sensory input must not be too disparate from that which the child has already assimilated (35). Thus, the content was graded or programmed to insure success experiences for all Ss. Success was denoted at first by concrete rewards. Continued success met with verbal praise after the relationship between tangible reward and verbal praise was established. The continuation of verbal praise for success was designed not only to be effective for maintaining successful performance, but also to reinforce attitudes of persistence, increasing levels of aspiration, and desire to achieve. Thus, positive attitudes toward school and school activities were encouraged.

Each day of the treatment program a variety of activities were planned and executed. See Appendix A for samples of specific planned activities for a given content unit and Appendix B for further samples of activities. The school day was split into seven different activity periods. At the beginning of each school day, approximately 20 minutes was spent with all training Ss, their SGLs, and their master teachers together for a general content lesson. These lessons were broad in scope and typically served to introduce the specific activi-

ties which followed. See Appendix A for a sample "master lesson" or large group lesson outline.

After the total group of experimental Ss met for the major content lessons, small groups of four to six Ss and the assigned SGL began a variety of tasks designed to relate to the major content lesson, but using a wide range of materials and techniques. There were five different activity "stations" available for use by the small groups. These were: (a) "art" station for using paints, color crayons, paper mâché, clay, etc.: (b) "audio visual and music" station wherein film strips, tape recordings, records, and real rhythm musical instruments were used: (c) "block and wheel toy" station where toy trucks and cars, tricycles, and wagons could be used as well as large kindergarten blocks; (d) "idea" station wherein books, flannel boards and the like were used; and (e) "action" station where parquetry blocks, beads, peg boards, primary puzzles, etc., were employed.

Only four of these five different "stations" was used by any one small group each day. Attempts were made to relate the activities in each of the stations to the major content lesson provided by the training unit master teacher. See Appendix A for sample lessons during these small group activities. The lessons taught by SGLs during these activity periods were all cognitively oriented; that is, all lessons involved teaching for the mastery of some skill. Complete and accurate verbalizations

by Ss which related to lessons was always encouraged and rewarded. Only incidently during the lessons were specific social and personal skills stressed. The major objective during the small group activities was cognitive stimulation and growth.

After the fourth activity lesson of the day Ss were served lunch in the school cafeteria. Variety in the lunch menu was provided so that Ss' exposure to new stimuli could continue even during lunch. Labeling of the various foods was encouraged and Ss were urged to continue verbal exchange among themselves and with their SGL during the lunch time.

After the lunch period a short time (about 15 minutes) was spent on the school playground. Organized games as well as free play took place. Games which were designed to aid in the development of gross motor skills were organized and led by the staff. As in the other activity periods throughout the day, verbalizations by Ss were encouraged and rewarded.

After the playground session, Ss, their SGL's, and master unit teachers reconvened for a final content lesson. Generally, this last lesson of the day was designed to remind Ss of what they had learned during the day. Efforts were made to have the Ss themselves provide a recapitulation of the day's events. Content for the next day was suggested and then Ss were returned home by school bus.

This pattern of activities in large and small groups was

followed throughout the ten weeks of the summer session. Slight changes in daily routine were made for field trips to the airport, for a train ride, and to go to the beach.

Dependent Variable Measures

Several dependent variable measures were used to test the hypotheses concerning increased cognitive skills of treated Ss. Three different types of abilities were assessed. The following tests were employed to measure the intellectual skills of experimental and comparison Ss: (a) the Stanford-Binet, form L-M: SBLM (45); (b) the Peabody Picture Vocabulary Test: PPVT (17); (c) the Pictorial Test of Intelligence: PTI (19); and (d) the Wechsler Pre-school and Primary Scale of Intelligence: WPPSI (48).

Oral language functions were assessed using two subtests from the Illinois Test of Psycholinguistic Abilities: ITPA (32). The Auditory-Vocal Automatic (A-V) subtest was used to sample Ss' abilities to predict future linguistic events and to sample understanding of underlying grammatical structure of English. The Vocal-Encoding (V-E) subtest was employed to assess a S's ability to generate descriptions, functions, and properties of common objects.

In addition to the above measurements, indices of school achievement were also gathered. The instruments used to evaluate school achievement were: the Metropolitan Readiness Test and two forms (Primary I and Primary II) of the Metropolitan Achievement Tests.

Hypotheses

The research hypotheses and the variables employed in testing each are listed below.

Hypothesis 1.

Training group Ss (T1 and T2) will earn significantly higher short-term criterion gain scores on the SBLM and PPVT than will "outside-the-area" comparison group (CG'66 and CG'67) Ss. To test this hypothesis, the two tests were administered to T1 and CG'66 Ss in April and May of 1966, and again in August and September of 1966. The two instruments were also administered to T2 and CG'67 Ss in April and May of 1967, and again in August and September of 1967.

Hypothesis 2.

Training group Ss (T1 and T2) will earn significantly higher short-term criterion scores at entry into kindergarten than will similar Ss in the "front-wave comparison group" (C'65 Ss). To test this hypothesis, the SBLM, PPVT, WPPSI, and PTI were administered to C'65 Ss in the fall of 1965; to the T1 Ss in the fall of 1967; and, to the T2 Ss in the fall of 1968.

Hypothesis 3.

Training group Ss (T1 and T2) will earn significantly higher short-term criterion scores at entry into kindergarten than will similar Ss (C'67 and C'68) in the same classes. To test this hypothesis, the SBLM, PPVT, WPPSI, and PTI were administered to

T1 and C'67 Ss in the fall of 1967, and to the T2 and C'68 Ss in the fall of 1968.

Hypothesis 4.

Training group Ss (T1 and T2) will earn significantly higher scores on selected oral language measures at the end of kindergarten than will similar Ss in the same classes (C'67 and C'68). To test this hypothesis, two subtests from the ITPA were administered to T1 and C'67 Ss in May of 1968, and to T2 and C'68 Ss in May of 1969. The subtests used were the Auditory-Vocal Automatic (A-V) and the Vocal Encoding (V-E) subtests.

Hypothesis 5.

Training group Ss (T1 Ss) will earn significantly higher reading readiness test scores at the beginning of first-grade than will similar Ss in the same classes (C'67 Ss). To test this hypothesis, the Metropolitan Readiness Test was administered to T1 and C'67 Ss in the early part of the 1968 school year.

Hypothesis 6.

Training group Ss (T1 plus T2) will earn significantly higher school achievement test scores at the end of first-grade than will similar Ss in the same classes (C'67 plus C'68). To test this hypothesis, the Metropolitan Achievement Test, Primary Battery I was administered to T1 and C'67 Ss in May of 1969, and to the T2 and C'68 Ss in May of 1970.

Hypothesis 7.

Training group Ss (T1) will earn significantly higher school achievement test scores at the end of second-grade than will similar Ss in the same classes (C'67). To test this hypothesis, the Metropolitan Achievement Test, Primary Battery II was administered to T1 and C'67 Ss in May of 1970.

Due to extreme attrition among the "outside-the-area comparison group" Ss (CG'66 and CG'67), it was not possible to obtain long-term criterion scores from them for comparison purposes. Indeed, the attrition among all groups studied was quite high, and terminal results are based upon small samples.

CHAPTER IV

RESULTS

The results of the present investigation are reported in terms of analyses designed to test each of the seven research hypotheses. Where number of training group Ss was large, separate analyses for T1 and T2 Ss are reported. Where the number of training group Ss is relatively small the two groups, and their relevant comparison groups, were collapsed.

Hypothesis 1 was tested by administering the SBLM and PPVT to T1 and CG'66 Ss just before and after the first 10-week training sessions. The time span was constant for T2 and CG'67 Ss, but occurred one calendar year later. The correlated t-test results for within-group change for all groups are found in Table 1. The changes in mean scores from first to second testing for both T1 and T2 Ss were significant beyond the .01 level on both criterion measures. The CG'66 Ss earned significantly higher SBLM scores at the second testing over the first ($p<.05$) but showed no significant change in mean PPVT scores. The mean CG'57 Ss' scores on both the SBLM and PPVT were significantly higher upon re-testing ($p<.05$).

Because there were large differences between mean SBLM and PPVT scores of T1 or T2 and CG'66 and CG'67 Ss at initial testing, analyses of covariance for difference between terminal means adjusted for initial scores were computed. The resulting F ratios are also reported in Table 1. Each of the four comparisons

TABLE 1

COMPARISONS OF SHORT-TERM CRITERION GAIN SCORES FOR TREATMENT AND OUTSIDE-THE-AREA COMPARISON Ss

Test	Group	N	Time 1 Mean	Time 1 Sigma	Time 2 Mean	Time 2 Sigma	t	Adj.[a] Mean	F-ratio[b]
	T1	41	85.6	16.6	94.4	16.2	6.13**	91.9	
									4.19**
	CG'66	17	75.9	16.2	80.2	19.9	2.04*	86.4	
SBLM									
	T2	51	85.0	16.4	95.8	15.7	7.55**	81.3	
									6.62**
	CG'67	16	66.4	13.6	74.3	11.8	2.51*	84.4	
	T1	39	71.5	16.9	83.9	18.8	6.75**	81.3	
									8.23**
	CG'66	17	62.1	16.6	65.1	8.9	1.03	71.2	
PPVT									
	T2	51	69.2	17.0	815	18.6	6.61**	78.8	
									8.06**
	CG'67	16	55.4	5.4	59.9	10.6	2.89*	68.5	

* $p < .05$
** $p < .01$
a. re-test means adjusted by covariance procedures for initial scores
b. F-ratio for testing homogeneity of adjusted means

between groups (T1 vs. CG'66 and T2 vs. CG'67) was significant beyond the .01 level. Each of the adjusted mean comparisons favored training group Ss. Thus, Hypothesis 1 was supported.

Hypothesis 2 was tested using data from four separate dependent variable measures. To determine whether training group Ss earned higher short-term criterion scores than either the "fr st-wave comparison group" (C'65) or "in the same classes" comparis groups (C'67 and C'68), four measures were used. These were the: BLM, PPVT, WPPSI, and PTI. All tests were administered indi idually to Ss during the first few months of kindergarten.

The results of between-group uncorrelated t-tests for differences between means are found in Table 2 for the T1 comparisons, and in Table 3 for the T2 comparisons. Comparing criterion scores of T1 with C'65 Ss it was found that T1 Ss earned significantly higher scores on four of the six comparisons. Differences significant beyond the .01 level were observed on the SBLM, and PTI while differences beyond the .05 level were observed on the WPPSI Performance and Full Scale IQ measures. No significant differences between these two groups were observed on the PPVT or the Verbal IQ measure of the WPPSI.

The short-term criterion score comparisons of T1 and C'67 Ss yielded significant differences on all six measurements. Differences beyond the .01 level were found on the SBLM, PPVT, PTI, WPPSI Verbal IQ, and WPPSI Full Scale IQ measures. The

TABLE 2

COMPARISONS OF MEAN SBLM, PPVT, PTI, AND WPPSI IQs OBTAINED IN THE FIRST MONTHS OF KINDERGARTEN FOR T1 VS. C'65 AND C'67 COMPARISON GROUPS

Variable	Group	N	Mean	Sigma	Xdiff.	t
SBLM	C'65	69	85.8	12.3		
	Ti	26	99.2	14.8	13.4	4.04**
	C'67	64	84.2	13.5	15.0	4.33**
PPVT	C'65	69	83.1	18.4		
	Ti	26	87.6	17.5	4.5	1.07
	C'67	64	73.6	16.8	14.0	3.41**
PTI	C'65	60	88.1	15.1		
	Ti	25	99.4	12.4	11.3	3.30**
	C'67	73	87.9	15.0	11.5	3.43**
WPPSI VIQ	C'65	60	85.4	14.0		
	Ti	25	91.6	14.1	6.2	1.87
	C'67	73	82.0	12.0	19.6	3.32**
WPPSI PIQ	C'65	60	90.8	14.4		
	Ti	25	98.3	11.0	7.5	2.33*
	C'67	73	91.6	13.6	6.7	2.24*
WPPSI FSIQ	C'65	60	86.9	14.4		
	Ti	25	94.2	11.9	7.3	2.21*
	C'67	73	85.2	11.6	9.0	3.25**

* p <.05
** p <.01

TABLE 3

COMPARISONS OF MEAN SBLM, PPVT, PTI, AND WPPSI IQs OBTAINED IN THE FIRST MONTHS OF KINDERGARTEN FOR T2 VS. C'65 AND C'68 COMPARISON GROUPS

Variable	Group	N	Mean	Sigma	$\bar{X}$diff.	t
WPPSI	C'65	69	85.8	12.3		
					8.2	2.94**
SBLM	T2	35	94.0	14.8		
					8.6	2.53*
	C'68	63	85.4	15.5		
	C'65	69	83.1	18.4		
					9.7	2.27*
PPVT	T2	35	92.8	20.9		
					21.9	4.28**
	C'68	56	70.9	26.9		
	C'65	60	88.1	15.1		
					5.8	1.89
PTI	T2	35	93.9	14.0		
					7.0	2.39*
	C'68	56	86.9	12.9		
	C'65	60	85.4	14.0		
WPPSI					7.8	2.40*
	T2	35	93.2	15.7		
VIQ					10.1	3.04**
	C'68	63	83.1	15.3		
	C'65	60	90.8	14.4		
WPPSI					10.3	3.70**
	T2	35	101.1	11.8		
PIQ					6.3	2.34**
	C'68	63	94.8	13.6		
	C'65	60	86.9	14.4		
WPPSI					9.1	2.98**
	T2	35	96.0	14.0		
FSIQ					11.0	3.87**
	C'68	63	85.0	12.0		

* p <.05
** p <.01

scores earned by the two groups on the Performance IQ from the WPPSI were significantly different at the .05 level.

Similar results were obtained when comparisons of scores earned by T2 and C'65 Ss were made. Five of the six comparisons were significantly different from zero. Three comparisons between T2 and C'65 were significant beyond the .01 level; these comparisons were for the SBLM, WPPSI Performance IQ, and WPPSI Full Scale IQ scores. The comparisons significant beyond the .05 level were for the PPVT and WPPSI Verbal IQ scores.

The short-term criterion score comparisons of T2 and C'68 Ss yielded significant differences on all six measurements. Significant differences beyond the .01 level were observed on the PPVT, WPPSI Verbal IQ, WPPSI Performance IQ, and WPPSI Full Scale IQ. Differences significant beyond the .05 level were revealed on the SBLM and PTI comparisons. Hypothesis 2 was supported.

Hypothesis 3 was concerned with differences in language usage of training group Ss and comparison Ss. The A-V and V-E subtests of the ITPA were administered to T1, T2, C'67, and C'68 Ss in May of Ss' kindergarten year. Because the number of Ss in each group was relatively small, the two training group samples were combined as were the two comparison group samples. The results of uncorrelated t-tests of differences between means are listed in Table 4. Both comparisons yielded significant differences beyond the .01 level and favored the training over the comparison groups.

TABLE 4

END OF KINDERGARTEN ORAL LANGUAGE PERFORMANCE OF 49 TREATMENT (T1 AND T2) VS. 98 COMPARISON (C'67 AND C'68) SUBJECTS

Variable	Group	N	Mean	Diff.	Sigma	t
ITPA A-V	T	49	3.3		1.1	
z + 4.00				.7		3.45**
	C	98	2.6		1.2	
ITPA V-E	T	49	3.9		1.0	
z + 4.00				.5		3.05**
	C	98	3.4		.8	

** p<.01

While means on both variables, for both groups, were below the normative sample means, it is interesting to note that training group Ss' mean on the V-E subtest was very close to the expected normative mean. The results of these two tests support research Hypothesis 4.

Hypothesis 5, concerning differences between reading readiness test scores at the beginning of first-grade for training group and comparison Ss, was tested using only T1 and C'67 Ss' scores. In September of 1968, the Metropolitan Readiness Test: (MRT) was administered in the participating schools. The results of the comparisons of MRT raw scores for T1 and C'67 are presented in Table 5.

TABLE 5

COMPARISONS OF METROPOLITAN READINESS TEST RAW SCORES FOR T1 AND C'67 Ss OBTAINED AT THE BEGINNING OF FIRST GRADE

Variable	Group	N	Mean	Sigma	t
Word	T1	20	7.4	3.4	
					1.57
Meaning	C'67	37	6.1	2.1	
	T1	20	8.6	2.5	
Listening					.16
	C'67	37	8.5	1.9	
	T1	20	5.5	3.0	
Matching					-.12
	C'67	37	5.6	2.8	
	T1	20	5.8	3.6	
Alphabet					4.05**
	C'67	37	4.5	3.8	
	T1	20	8.7	3.7	
Numbers					2.47**
	C'67	37	7.9	3.5	
	T1	20	5.1	3.7	
Copying					-.31
	C'67	37	5.2	3.7	
Total	T1	20	40.9	18.4	
					.95
MRT Score	C'67	37	36.4	14.4	

** p<.01

Mean score differences on the seven MRT subparts favored T1 over C'67 Ss in five comparisons. On two of these variables, Alphabet and Numbers, the T1 means were significantly higher than C'67 means at the .01 level. At best, Hypothesis 5 was only partially supported; the most conservative interpretation is that Hypothesis 5 was rejected.

Hypothesis 6 was concerned with school achievement at the end of first-grade for training Ss vs. comparison Ss. The Metropolitan Achievement Test, Primary Battery I (MAT) was administered to remaining T1 and C'67 Ss in May of 1969, and to remaining T2 and C'68 Ss in May of 1970. Due to attrition from all four groups, the T1 and T2 samples were combined as were the C'67 and C'68 samples for the analyses. The uncorrelated t-test results of mean MAT raw scores for training vs. comparison Ss are found in Table 6. No differences were found between mean scores for training unit Ss and comparison group S. The number of Ss per group for this set of analyses varied for each of the subtests due to the need for the MAT to be administered during several sittings. Absenteeism accounts for the small differences in numbers in the group. Additionally, one teacher refused to administer the Reading subtest to her pupils because it would interfere with other planned activities. Five T2 and two C'68 Ss were enrolled in that classroom. Research Hypothesis 6 was rejected.

TABLE 6

COMPARISONS OF METROPOLITAN ACHIEVEMENT TEST RAW SCORES FOR TRAINING UNIT (T1 + T2) AND COMPARISON (C'67 + C'68) GROUPS AT THE END OF FIRST GRADE

MAT Variable	Group	N	Mean	Sigma	t
Word Knowledge	T	43	22.6	7.99	.36
	C	56	22.0	7.36	
Word Discrimination	T	44	20.9	7.23	.16
	C	56	20.6	7.49	
Reading	T	39	18.3	9.11	-.07
	C	54	18.4	8.20	
Arithmetic Concepts & Skills	T	44	47.9	10.56	-.12
	C	56	48.2	10.37	

Hypothesis 7 dealt with school achievement at the end of second-grade for training vs. comparison Ss. The Metropolitan Achievement Test, Primary Battery II was administered to all remaining T1 and C'67 Ss in May of 1970. Further attrition resulted in very small numbers of Ss in either group, and thus, a Wilcoxon Rank-Sum Test (8) was computed to determine differences in central location of the distributions to the two groups.

The means, standard deviations, and W_n statistics for MAT-variable raw scores are reported in Table 7.

TABLE 7

RANK SUM COMPARISONS OF METROPOLITAN ACHIEVEMENT TEST RAW SCORES OBTAINED AT END OF SECOND GRADE FOR 12 T1 AND 18 C'67 SUBJECTS

MAT Variable	Group	Mean	Sigma	W_n*
Word Knowledge	T	15.7	7.62	167
	C'67	16.9	6.22	
Word Discrimination	T1	23.3	7.78	174
	C'67	20.9	9.58	
Reading	T1	20.0	8.02	180
	C'67	19.8	7.86	
Spelling	T1	12.3	9.60	189
	C'67	14.2	7.98	
Arithmetic Total	T1	49.2	12.18	199
	C'67	51.2	13.05	

* $p<.05$ when $W_n \leq 146$ (one-tailed test)

None of the comparisons for differences in the location parameter of the two distributions was significant. In terms of raw score means, the C'67 group had higher mean scores on three of the five subtests while the T1 group had higher mean scores on but two of the battery subtests. However, the W_n statistic results revealed that there were no real differences between the scores from the two samples. Thus, Hypothesis 7 was not supported.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

DISCUSSION

Initial results of the present study were very encouraging. Indeed all hypotheses concerning differences between the scores of training unit Ss and comparison Ss on traditional measures of intellectual functioning were supported. At the time T1 and T2 Ss entered kindergarten they outperformed comparable age peers on all the tests administered. While prediction of school success from intelligence test scores obtained at an early age is not accurate, there is generally a positive relationship between the two kinds of performances. It was expected that T1 and T2 Ss would maintain their advantages over their comparison group Ss.

Of particular interest were the differences observed between the oral language measurements collected at the end of kindergarten. Again training unit Ss significantly outperformed comparison Ss. It is assumed that the constant urging of training Ss to verbalize during the preschool training accounted for this difference. Performance of training Ss on the Vocal Encoding subtest of the ITPA was "normal" in the sense that the mean score for T1 plus T2 Ss was at the normative sample mean. There was, it appears, internal maintenance within experimental Ss to make verbalizations about the things in their environment. This skill was one which was especially stressed during the summer treatment sessions. Apparently, however,

superior skills in the sampled oral language usage did not transfer to tasks of reading and simple arithmetic.

None of the school achievement hypotheses was supported. There are many possible explanations for the lack of support of these "in-school achievement" hypotheses, and at least three possibilities are deemed worth considering.

First, there were really no differences between intellectual functioning level of training and comparison Ss even at the beginning of kindergarten. The tests used in kindergarten were all individually administered instruments, and training group Ss had been exposed to two individual testing sessions prior to entrance into kindergarten. Comparison group Ss had not been so exposed. Some of the in-kindergarten differences could be due to facilitory practice effects and familiarity with individual testing procedures gained by training Ss and not comparison Ss. However, two of the tests employed in kindergarten were unknown to experimental Ss. These were the last measurements to be taken. Thus no practice effects could be operating during the use of the Wechsler Preschool and Primary Scale of Intelligence and the Pictorial Test of Intelligence. Additionally, comparison Ss had, by the time these two scales were administered, experience with two recent individual testing sessions. Since significant score differences were observed on these two dependent variable measures as well as on the other two measures, it is unlikely that practice and familiarity

with procedures accounted for a very large portion of the differences in performance by the two groups of Ss.

A second possible explanation is that comparison Ss received more individual attention and assistance during kindergarten than did training unit Ss. It is possible that those children in kindergarten who were not functioning at as high a level as training Ss were the recipients of more of the teachers' time. Teachers may be likely to help those children who need help the most, and overlook the children who are already performing adequately. In the overcrowded classrooms in the schools in which training and comparison Ss were enrolled this is a very plausible possibility. In addition to the possibility of differential teacher attention, it is possible that training unit Ss experienced a sort of "cultural shock" by moving from the situation of one adult to five children to a situation of one adult to 35 children. Adequate transfer from the preschool to the school setting probably did not take place.

A third possible explanation for the lack of differences in school achievement between the experimental and comparison Ss by the time of first grade has to do with possible selective attrition over a two to three year period. Frequently it is the case that children from upwardly mobile families perform better in school than children from stationary families. It is possible that more of the training Ss who were performing well than similar

comparison S left the participating schools. At any rate, attrition of both experimental and comparison Ss may have had some unknown effect upon the terminal samples when achievement test data were gathered.

While the results of the Early Training Project (31) are mixed, the authors suggest that results are still encouraging. Like many of the other preschool intervention studies which have been reported, the Ss in the Klaus and Gray project have been Negro. Perhaps one of the reasons why the Ss in the present study did not enjoy even the mixed greater school success of that reported by Klaus and Gray is due to the greater disparity between the Mexican-American cultural background and white middle-class background than is the case between the Negro and white cultural background. In order to enjoy school success, children must internalize and work easily within the so-called "middle-class ethos" of the school. Young Mexican-American children may find it more difficult than Negro children to accept and use the needed middle-class values and attitudes. Thus it may be the case that more intensive preschool training, or longer periods of preschool training are required to bring the lower SES Mexican-American child to the point of being able to cope with the quite different demands of the middle-class school system.

CONCLUSIONS AND IMPLICATIONS

In general the overall results of the present longitudinal

study are strikingly similar to those reported by other investigators involved in the follow-up of children participating in preschool intervention programs (16,26,31,51). The results on the present and other studies may be clearly divided into two parts.

First, the preschool experience gained by the training unit Ss apparently was effective in modifying cognitive performance in kindergarten as measured by traditional tests of intellectual ability. Experimental Ss earned significantly higher scores on the dependent variable measures designed to sample level of cognitive functioning, than did comparable age peers in the same classrooms.

Second, the early school advantages apparent in kindergarten did not result in improved performance on indices of school achievement in the first-or second-grade. At the beginning of first-grade, treated Ss did not perform differently from comparison Ss on measures of reading readiness. By the end of first-grade, no differences between the two groups were observed on a battery of academic achievement measures.

Intervention, by making available a highly structured, cognitively oriented two-year preschool program succeeded in reaching a set of "first goals" for Mexican-American disadvantaged children. Superior performance on tasks thought to be highly related to school success at the outset of formal schooling were, indeed, observed. Subjects with the intensive preschool experience

did excel their age peers on the tests which sampled intellective functions. These "first goals", outlined in the present study by the first four research hypotheses, were met. The results were very encouraging.

Initial evaluations of other preschool programs, including Operation Head Start, have pointed to great promise for the effectiveness of preschool experience among the disadvantaged. Howard and Plant (23) reported that Operation Head Start Ss earned significantly higher scores than a matched comparison group on indices such as the Pictorial Test of Intelligence, Peabody Picture Vocabulary Test, and the Performance Scale of the Wechsler Preschool and Primary Scale of Intelligence. Similar results were reported for children participating in Operation Head Start classes by Eisenberg and Conners (18), and by Riley and Epps (38). These initial school advantages were presumed to be lasting and it was hoped that subsequent higher academic achievement would result.

Other studies, wherein much time was spent with young disadvantaged children prior to school entry, initially led to the conclusion that intensive preschool experience for the disadvantaged might be extremely beneficial in reversing the frequent school failure observed among such children. Gray and Klaus (21) reported that IQ gains for their sample of disadvantaged black Ss lasted up to 39 months. Wilkerson (51)

reported that children enrolled in the Perry Preschool Project (50) earned significantly higher scores on cognitive measures during their first year of school.

Once the move was made to sample school achievement rather than abstract cognitive functioning, the supposed advantages were no longer apparent. In most of the longitudinal studies, including the present one, initial advantages associated with preschool education disappeared as the children continued in school and actual achievement rather than aptitude was evaluated. Part of the discrepancy between the scores earned on intelligence tests and on school achievement tests lies in the less than perfect relationship between the two kinds of measurements. While IQ scores tend to be good predictors of school performance, it is rare that performance on intelligence tests account for more than 50 per cent of the variance of school achievement test scores (13). Scores on a test like the Stanford-Binet might well be interpreted as an index of potentiality for performance in academic tasks; there may be a great difference between the "potential" and the "actual."

It has been suggested that part of the reason that the early promise associated with preschool training has not borne fruit has to do with the lack of follow-up with the training once Ss enter school. Shriver (41) has pointed out that the disadvantaged child with the typical preschool experience moves

from a setting where the adult to child ratio is favorable to one where there is one teacher for 30 or 40 children. Thus the individual attention to which the child eagerly responded during preschool is unavailable; the assistance he individually needs to maintain his initial interest and performance is impossible to achieve.

An example of the difficulties experienced by the Ss in the present study at the kindergarten level illustrates well the point made by Shriver. Training group Ss had experience with a 1:5 teacher to children ratio in preschool. The kindergarten classes at one of the schools attended by Ss were overcrowded to the point that one teacher had 42 children enrolled in a morning class and 38 children enrolled in an afternoon class. Such a teacher-to-children ratio made it almost impossible for the teacher to attend to the learning needs of any one specific child. Where primary classrooms have such a large enrollment, the teacher's function may well become one of custodian rather than one of facilitator in the learning process. Stress necessarily will be placed on quietness and good citizenship and probably at the expense of making the learning process exciting and stimulating.

It is not, however, entirely the fault of the schools when such dismal events take place. Schools do not and cannot provide preschool education for the large numbers of the disadvantaged. Special programs can probably better provide such services. But,

as Reissman (37) has indicated, the special programs are stopped too soon. Shriver (41) has forcefully stated that special training for disadvantaged children cannot terminate just because the children enter kindergarten or first-grade. And, as Klaus and Gray (31) wrote, it would seem most peculiar and naive to think that limited preschool training (in the current investigation about 100 hours) can offset the years of deprivation the child has had up to and during the first few school years. These investigators, including the present one, suggest that special assistance for the disadvantaged must not only start early, but also continue beyond the time of entry into school if early training effects are to be lasting.

CHAPTER VI

SUMMARY

This is the report of the rationale, design, and execution of a longitudinal investigation of the intellectual and achievement effects of a two-year cognitively oriented preschool for disadvantaged Mexican-American children.

Seven different groups of Mexican-American children from very low socio-economic family backgrounds were studied. Two groups were each exposed to two, 10-week successive summer sessions of cognitively oriented preschool prior to entry into kindergarten. These training Ss were exposed to a wide variety of cognitively structured activities daily in small groups of 5 or 6 Ss. The small groups were led by Mexican-American high school students under the supervision of experienced primary teachers. All activities were designed to facilitate Ss in gaining relevant school-related abilities and experience.

The other five groups were comparison groups; two were from outside the geographical area of residence of the treatment Ss, and three from the school attendance areas of the treatment Ss.

Seven hypotheses were tested through gathering samples of intellectual or school achievement abilities. Psychometrics utilized were: (a) the Stanford Binet, Form L-M (SBLM), (b) the Peabody Picture Vocabulary Test (PPVT), (c) the Pictorial Test of Intelligence (PTI), (d) the Wechsler Preschool and Primary Scale of Intelligence (WPPSI), (e) the Auditory Vocal (A-V) and Vocal Encoding (V-E) subtests of the Illinois Test of Psycho-

linquistics (ITPA), (f) the Metropolitan Readiness Test (MRT), and, (g) two forms (Primary I and Primary II) of the Metropolitan Achievement Test (MAT). All hypotheses tested involved comparing performance of treatment group Ss vs. that of appropriate comparison group Ss.

Hypothesis 1 was that training group Ss would earn significantly higher short-term criterion gain scores on the SBLM and PPVT than would outside-the-area comparison group Ss. Hypothesis 1 was supported.

Hypothesis 2 was that training group Ss would earn significantly higher short-term criterion scores at entry into kindergarten on the SBLM, PPVT, WPPSI, and PTI than would Ss in the "front-wave" comparison group. Hypothesis 2 was supported.

Hypothesis 3 was that training group Ss would earn significantly higher short-term criterion scores at entry into kindergarten on the SBLM, PPVT, WPPSI, and PTI than would similar Ss in the same kindergarten classes. Hypothesis 3 was supported.

Hypothesis 4 was that training group Ss would earn significantly higher scores on oral language measures ITPA A-V and V-E at the end of kindergarten than would similar Ss in the same kindergarten classes. Hypothesis 4 was supported.

Hypothesis 5 was that training group Ss would earn significantly higher reading readiness test scores on the MRT at entry into the first grade than would similar Ss in the same classes. At best, Hypothesis 5 was partially supported, but to be conservative Hypothesis 5 was judged to be not supported.

Hypothesis 6 was that training group Ss would earn significantly higher school achievement test scores on the MAT at the end of first grade than would similar Ss in the same classes. Hypothesis 6 was not supported.

Hypothesis 7 was that training group Ss would earn significantly higher school achievement test scores on the MAT at the end of second grade than would similar Ss in the same classes. Hypothesis 7 was not supported.

The results of this longitudinal investigation were compared with those reported by others particularly with reference to the early advantage of training group Ss over comparison Ss until entry into first grade. Additionally, as with reports by others, the lack of "in-school" achievement differences between training and comparison Ss were discussed with reference as to possible reasons for the apparent loss of early advantage by training group Ss.

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APPENDIX A

SAMPLE WEEKLY AND DAILY LESSON PLANS AS WRITTEN
BY LEAD TEACHERS OR SMALL GROUP LEADERS

Sample Master Lesson Outline For Large Group Activities

Unit: Transportation
Teacher: Miss Sue Curia

MONDAY: General introduction to "transportation."
- A. What is transportation? What does it mean?
- B. What happened before we had wheels, trains, etc.?
- C. Game to list different types of transportation.
- D. Activity of walk, then ride; next carry, then use wagon.
- E. Use the small book Tommy Train.
- F. Learn the song "Old Brass Wagon".

TUESDAY: Trains
- A. The different cars on a train: engine (locomotive) flatcars, caboose.
- B. Passenger and freight trains.
- C. Workers on the train: engineer, conductor, porters, signalmen.
- D. The train must travel on tracks.
- E. Use books Little Engine That Could and Choo-Choo The Train.
- F. Learn songs "Little Red Caboose" and "Railroad Train".

WEDNESDAY: Cars and Trucks
- A. The kinds of trucks: milk, freight, mail, produce, etc.
- B. Some have 4 wheels, others have 6-8 wheels, etc.
- C. What is a dump truck used for?
- D. Use book Dump Truck.
- E. Learn song "Wait for the Wagons."

THURSDAY: Airplanes
- A. The parts of an airplane: wings, fuel area, body, and tail.
- B. Passenger and/or freight carriers.
- C. Workers: pilot, navigator, stewardesses.
- D. Planes are faster than other ways of traveling.
- E. Learn song "Here We Go."

FRIDAY: Boats
- A. Different kinds of boats: sailboat, rowboat, freighter, tugboat, canoe, passenger liner.
- B. Workers on a boat: captain, crew, passengers.
- C. How do boats move in the water?
- D. Learn song "Allee Allee O".

Sample Master Lesson (Week) Small Group Activities

Unit: Forest Animals
Small Group Leader: Jim Gallardo

Concepts and Understandings to learn:

1. What is meant by the forest?
   - A. The trees and their characteristics.
   - B. Home for animals.
   - C. Specific animals in the forest such as: bears, skunks, squirrels, and deer; birds, such as owl, eagle, and hawk.

2. Number and color concepts.
   - A. Stress the colors blue for the ponds in the forest and green for the trees.
   - B. Use of peg boards in the color and number concepts.

3. Finish the pinwheel started last week.
   - A. Review the use of the "wind" in making pinwheels work.
   - B. Introduce how the wind helps trees in the forest shed leaves.

4. Use wheel toys to help in motor coordination and direction following.
   - A. Build a garage and have children learn to "back the wagon into the garage space."

Suggested Activities:

1. Try not to bore the children with the usual number of pictures. I will use an indirect method - A Flannel Board Story and then a Story book.
2. Using green, red, and blue pegs, we will build patterns on the peg boards. The patterns will be vertical and horizontal as in the normal reading pattern. I will use a yellow colored peg to reward them for making the correct patterns. This will be a"game."
3. Finish the pinwheels and give the lesson on "WIND."
4. Set up "garages" for them to back-up into to test their coordination. This might be difficult for them but I doubt it.

5. Make a forest scene in the art activity using paint and sponges.
6. Work with beads on a lesson similar to that taught using the peg boards.
7. Use parquetry blocks and cloth geometric figures to go over their mastery of colors and the shapes "square," "rectangle," "a circle," and "triangle."

Evaluation of the Weeks Activities and Other Details

"Gee, the 17th today! - Another unsuccessful attempt at the pin-wheels; try again tomorrow".

"Once again, for two straight periods, excellent lessons were attempted and completed. No. 1 was in the 'action' room where I had a bead lesson. It works perfectly! Beads of assorted colors - all the yellow beads were omitted and used as reinforcements (great). I had at all times, control of the beads, that is, they were within arms length. CONTROL OF TEACHER - not STUDENT. I would call out a number (1 to 3) then a color. The first one to complete the task was rewarded, though, I did make it possible so that all could have a chance at being rewarded. Then the winner would be the one who had the most yellows. But, how could they tell who won? They had to count the yellows! It's a good lesson that I barely finished, though, I could have stretched it to 30 minutes."

"In the Idea room we quickly reviewed beaver and badger characteristics for a few minutes which was maximum. Then I went on to tell them they were going to be the first to try out a special game. So gullible as they are .....Anyway, I gave them a stick (they had to tell me the color before getting the stick). I felt this was enough on colors."

"Objective Shape concepts: (triangle, square, and circle). All received a stick - I then proceeded to explain, going through a practice run on what I wanted them to do. I picked up a plastic figure and in an excited manner I said 'square' then again 'triangle' and 'circle'. Then I again picked up types of objects and said their name."

"Then I would quickly snatch a figure and let them see it and wait for the first correct response. The first one would get to put that figure on his stick. At first, this was a little mixed up as they were saying color responses as opposed to appropriate figure names. This was fun....for all of us. Once again time intervened. This could last a whole period and could include color and number concepts. The AIM was great."

"Good review about the beaver and racoon."

Sample Daily Lesson Plan

Unit: Forest Animals
Small Group Leader: Jim Gallardo

Objectives: Teach basic facts of Frogs and Turtles
1. Pond - they live in or near water.
2. Eat insects.
3. Babies - pollywogs.

Conceptual development of shape

Activities:
Art: Finish up pin-wheels - Wind lesson
Flannel Board lesson - triangles, squares, and rectangles.
1. Color concepts - green and red.
2. Shape concepts.
3. Number concepts.

Materials:
1. Frogs and Turtles - "I am a Mouse" story book.
2. Puzzles.
3. Sticks.
4. Flannel Board and various cloth shapes.

Skill development for specific children:
All of them appear to know the colors orange, yellow and blue.
David even knows blue.
Veronica knows purple and black.
Hector knows black.
Ralph is having trouble with green and red.

Attitude development for specific children:
It appears that every trip into the Film room breaks Hector up. I wish that Ralph vs. Veronica feud would get straightened out. Veronica is the only girl among three boys but she does hold her ground whenever it comes to pushing and lifting. David and Ralph are also constantly badgering each other.

Evaluation:
"That pin-wheel will yet be made. The wood was kind of hard for the pins. No luck. So, I countered by going into the play-house. I played some folk music for them.

"The music lesson was quite faulty. I wanted to play some recorded songs but the tapes were quite disorganized. NEED ORGANI-

ZATION IN THE MUSIC ROOM.

"Puzzles are becoming less challenging, but I feel I have come to the point where I'll have to start scrambling them. A neat accident happened in Idea. Above us were the phones. They were quite distracting so I had them each have a phone. I proceeded to call each of them by way of my special Batman telephone (ink pen) and taught the lesson about turtles and frogs from there. Very interesting (and professional). I'm learning Mrs. Copeland how to bounce from predicament to solution. It's absolutely necessary or else....!"

Sample Plan of Daily Activities

Unit: Animals of the Forest and Pond
Small Group Leader: Mario Dominquez

Objectives:
Wheel Toys: Parts of the road: curve, straight, bridge, etc.
Music: Even all boys can enjoy for fun a music listening time.
Action: Color concepts.
Ideas: What are skunks, o'possums, and rabbits? What do they look like? Where do they live and what kinds of food do they eat?

Activities:
Wheel Toys: Build a small road for toy cars and trucks; talk about what we are doing and how to keep the rules of the road.
Music: We'll try having a music class and see if I can get the boys to enjoy singing even though they don't think they do.
Action: We will work with colored beads. "Put on the red one, now the green one" and so on, for color mastery.
Ideas: Give a lesson with pictures and a story about a rabbit.

Skill development for specific children:
Both Johnny and Jonathan need help with colors.

Evaluation:
"We had fun in the Wheel Toys today. We built a really big road and both Johnies worked just fine. Our music lesson period didn't go very well but it wasn't bad though. I had more trouble with Johathan than with Johnny. However, it was the other way around in the Idea room. Johnny just won't pay attention or

participate here. Jonathan and Ricardo do participate very well but it was really hard to teach anything with Johnny upsetting the class. We had a good color exercise in the Action room all the time. Ricardo said six different colors by himself; but, Johnathan still doesn't know more than a couple."

APPENDIX B

EXAMPLES OF SPECIFIC TRAINING SESSION ACTIVITIES

Of the approximately 100, pre-tested, small-group activities used, brief descriptions of 20 are herein listed as examples. All were originally provided by James O. Miller, Ph.D. from the Klaus and Gray project.

A. Concept of size or form
   Purpose: To develop visual discrimination skills
   Materials: Collect circles, squares and rectangles of various sizes.
   Procedure: Child arranges in sequence according to size or form. (Different size pictures of toys and animals can be used, as well as objects.)

B. Matching shapes
   Purpose: To develop visual discrimination skills
   Materials: Mimeo or ditto sheets divided into half, top half in quarters. Forms on bottom half of sheet are cut, matched and pasted to forms at top half of paper. Forms may then be colored according to key.

C. Form Bingo
   Purpose: To develop visual discrimination skills.
   Materials: Tagboard ruled into 16 three inch squares. On each square a form, picture, etc., is permanently fixed. All cards are the same. An extra set is made for the instructor cut into individual S cards.
   Procedure: S cards are held up by teacher, child places bead over his match. (Child cards are the same but pictures are in different sequence.)

D. Sound Alikes
   Purpose: Auditory discrimination skills.
   Materials: Small pictures of things whose names rhyme e.g., man, fan, can, cat, hat, bat, etc. Egg carton with different color sections.
   Procedure: S sorts cards into different sections according to sound alikes.
   Variation: Each section has a stimulus picture. Or, set is made with odd word, S picks out the one which doesn't belong.

E. Animal frolic

Purpose: Categorizing, discrimination.

Materials: Pictures of barnyard, zoo, circus, forest, house. Small pictures of animals, e.g., dog, duck, goat, chick, tiger, elephant, etc.

Procedure: S sorts animals according to the category. Series is made up with one that doesn't belong, S chooses the one that doesn't belong.

F. Rhyming riddles

Purpose: Auditory discrimination skills.

Materials: Series of riddles, e.g,, I rhyme (sound like) sled, you sleep in me. What am I?

Procedure: Leader asks rhyme riddle, rewards correct response with token and tokens turned in at end of period for reward.

G. What's Missing?

Purpose: Visual discrimination.

Material: Large pictures mounted on tagboard with one important part missing. Envelopes containing missing parts.

Procedure: S finds missing part and places it in proper place. Or, leader holds up picture, child who can guess missing part by name gets to find it and place it on picture.

H. Change - O

Purpose: Visual discrimination.

Material: Chalkboard, chalk.

Procedure: Leader places large O on board. Ss hide eyes. Leader places line through O. Child who can tell what has been changed is rewarded. Successive changes can be made by adding or subtracting parts of figure.

I. Going Shopping

Purpose: Memorization of complex visual stimulus.

Material: Empty boxes, cartons, cans and other food containers on shelf. Shopping bag per child. Collage of pictures pasted on tag. Three pictures on up for increasing difficulty of task.

Procedure: Child is permitted to study card for short period, then without card goes shopping to get all articles on "list".

Variation: Many possible with this. Pick all the vegetables that sound like, "meat", etc.

J. I am wishing

Purpose: Developing descriptive and functional vocabulary.

Material: Empty shoe box. Set of cards with toy pictures, e.g., airplane, ball, bicycle, blocks, boat, bunny, cars, engine, hammer, scooter, etc.

Procedure: Each S is given about three cards. Leader says, "I wish for a toy that bounces." Child with proper picture deposits it in box and is rewarded.

Variation: Instead of functional definitions use descriptive definitions e.g., "I wish for a toy that's red, round, and smooth." Reverse process to get child to give description.

K. Matching Pictures

Purpose: Visual discrimination.

Material: Two sets of like pictures of objects such as a card, hat, cup, etc.

Procedure: Leader deals all the cards in one set to the children with about five or six cards to each. Then leader holds up one card at a time from the second set. The child who has the match takes the card. The one who matches up his five or six cards first wins.

Variations: Shapes and numbers may also be used.

L. Picture Stories

Purpose: To increase use of descriptive adjectives.

Materials: Pictures of animals doing tricks, eating, playing, etc.

Procedure: Leader shows picture and asks such questions as, "What is the dog doing?" "How does he feel?" "What does his hair feel like?"

M. Surprise Box

Purpose: Description using kinesthetic cues.

Materials: Box of objects of different sizes, shapes and textures, e.g., comb, tooth brush, bottle cap, crayon, emory board, handkerchief. Blindfold.

Procedure: S blindfolded draws an object out of the box. Leader asks such questions as: "Is it hard or soft?" "Is it large or small?" Many descriptive ideas are encouraged before leader lets S tell what he thinks the item is.

N. Who Am I, What Do I Do?

Purpose: Social recognition.

Materials: Pictures of community helpers, e.g., postman, grocer, policeman, dentist, garbage collector.

Procedure: Leader holds up picture, children guess who each one is and tells what he does.

Variation: Each child is given a picture which he holds behind him. In turn each child tells the other children what he does and asks them to identify him. He shows the picture of "himself" after the correct guess is made.

O. Find My Mother

Purpose: Concept development.

Materials: Two sets of pictures, one of baby animals, one of adult animals.

Procedure: S is asked to match baby animal with its mother.

P. Tell About Me

Purpose: Develop descriptive vocabulary (language fluency).

Materials: None.

Procedure: In turn, each child stands. The other children each give one descriptive idea about the child who is standing, e.g., "Bobby has on brown pants." "Bobby has short hair."

Q. Rhyming Words

Purpose: Categorization by auditory similarities.

Materials: Stimulus pictures: house, eye, clown, fire. Response pictures: tire, mouse, pie, town.

Procedure: Each child is given a Stimulus picture and chooses Response picture which goes with his Stimulus picture. After categorization, each child gives the words that his picture shows.

R. Peg It

Purpose: Color discrimination and quantitative concepts.

Materials: Set of color and number cards for each child. (Cards have string loop at one end). Peg board with peg for each child.

Procedure: Each child is given a set of cards. As he identifies each card he hangs it on his peg on the board. The child who has the most cards is the winner.

S. Belonging Together

Purpose: Comprehension development

Materials: Pictures or objects in several familiar categories such as toys, animals, foods, etc.

Procedure: Display objects and ask children to pick up (or point to) only the things to eat, only the things that go on wheels, etc.

T. Telling a Story in Sequence

Purpose: Learning sequence, language fluency.

Materials: Sets of pictures that tell a story in sequence.

Procedure: Ask S to arrange pictures so that they tell a story. Have child tell story.

APPENDIX C

INVESTIGATIONS REPORTED RELATED TO PROJECT MATTERS

With the exceptions of the reports by Jefferds, Sawrey, and Plant below, all were conducted by persons who were students at the time. Southern was a Ph.D. student in educational psychology at Stanford University, and all others were undergraduate or first year graduate students in Psychology at San Jose State College.

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APPENDIX D

PROJECT PERSONNEL 1965-1970

As indicated in the Acknowledgments, a project such as the current one simply cannot be undertaken and executed without the responsible involvement of numerous persons. The "staff" of this project are herein listed by type of involvement and an indication of length of involvement.

Small Group Leaders

Aguilar, Alfred	one year	Gallardo, Jim	two years
Aquino, Tony	two years	Garcia, Mary	two years
Castro, Maria	three years	Juarez, Ralph	one year
Castro, Tom	one year	Lagunas, Manuel	two years
Cortez, Virginio	one year	Lujan, Jessie	two years
Delgado, Irma	two years	Magee, Tamara	one year
Dominquez, Mario	two years	Rodriquez, Joe	one year
Duarte, Vera	two years	Salac, Diane	two years
Esparza, Connie	two years	Sanchez, Yolanda	one year
Fulgar, Jeanette	one year	Zuniga, Sylvia	two years

Training Unit Master Teachers

Catalano, Flora	two years	Curia, M. Susan	one year
Copeland, Edythe	two years	Elliott, Kathryn	two years

Research Assistants

Herold, Philip Les
two years

Southern, Mara L.
four years

Consultants

Clarke, Robert:	Design & Statistics
Finley, Carmen:	Outside-area Comparison Group
Jefferds, William:	School District Administration
McElliott, Joseph:	School District Administration
Miller, James O.:	Treatment Program
Russell, James:	School Principal
Skow, Jerry:	School Principal
Webber, Audra:	Preschool & Kindergarten Content